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मानक

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“Step Out From the Old to the New”

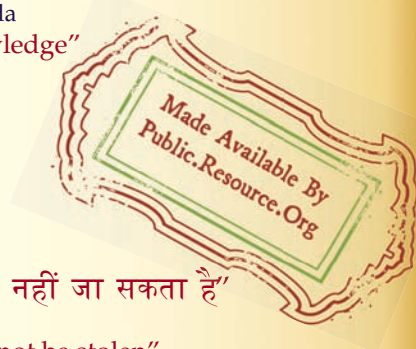
IS 14382 (1996): Automotive Vehicles - Speed Limiters -
Installed Requirements [TED 2: Automotive Primemovers]



“ज्ञान से एक नये भारत का निर्माण”

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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

(Reaffirmed 2002)

स्वचल वाहन — गति परिसीमक
संस्थापित अपेक्षाओं की विशिष्टि

Indian Standard

**AUTOMOTIVE VEHICLES — SPEED LIMITERS —
SPECIFICATION FOR
INSTALLED REQUIREMENTS**

ICS 43.040.30

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Primemovers Sectional Committee had been approved by the Transport Engineering Division Council.

The present day problem of overspeeding of automotive vehicles especially passenger buses and trucks on city roads is the main reason for the cause of accidents. This standard specifies the installed requirements of speed limiters and fitment of this device restricts the maximum speed of the vehicle by control of engine power.

While formulating the Indian Standard considerable assistance has been taken from:

BSAU 217 (Part 1):1987 Maximum road speed limiters for motor vehicles : Part 1
Specification for installed requirements.

The speed limiter of electronic type is already covered in IS 10144:1982 'Electronic speed limiters for diesel vehicles' which has already been notified in Rule No. 118 of Central Motor Vehicle Rules. The present standard is an important adjunct to it.

The committee responsible for preparation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2:1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

AUTOMOTIVE VEHICLES — SPEED LIMITERS — SPECIFICATION FOR INSTALLED REQUIREMENTS

1 SCOPE

This standard specifies the requirements for the performance and installation of speed limiting devices designed to limit the maximum speed of diesel-driven road transport vehicles.

2 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

2.1 Engine

The source (or sources) of the vehicle's motive power.

2.2 Speed Limiter Calibrator

The person responsible for carrying out the final check of the installation and calibration procedures (*see* 7).

2.3 Speed Limiter Supplier

In the case of speed limiters fitted during the manufacture of the vehicle, the vehicle manufacturer. In all other cases, the speed limiter manufacturer or his authorised representative.

2.4 Sensed Speed

The speed of an automotive vehicle as indicated by, or measured from, the speed sensing device used as a part of the vehicle speed limiter.

2.5 Set Speed

The intended mean vehicle speed when operating in a stabilized condition in accordance with 4.3. It shall be marked on the vehicle and used for calibration purposes.

2.6 Speed Limiter

A device designed to limit the maximum speed of an automotive vehicle by controlling the engine power of that vehicle.

2.7 Unladen Weight

The weight of a vehicle when it carries:

- a) no person, and
- b) a full supply of fuel in its tank, an adequate supply of other liquids incidental to its propulsion and no load other than the loose tools and equipment with which it is normally equipped.

2.8 $V_{\max}$

The maximum speed declared by the supplier of the speed limiter at which it is set to meet the requirements of this standard.

2.9 $V_{\min}$

The minimum speed declared by the supplier of the speed limiter at which it is set to meet the requirements of this standard.

3 GENERAL REQUIREMENTS

- a) The speed limiting device shall be calibrated to a set speed complying with the regulatory requirements.
- b) The speed limiters that have been type approved shall not be permitted to modify or redesign unless the validity of type approval has been revalidated.
- c) The speed limiter shall function at all levels of power of the engine.
- d) The speed limiter shall not affect in any way the normal operation of the engine control systems. However, upon reaching an overspeed condition, the speed limiting device shall override the relevant engine control systems to correct the overspeed condition.

4 SPEED CONTROL ON LEVEL GROUND

4.1 General

When used in accordance with the procedure given in Annex A, the requirements given in 4.2 and 4.3 shall be met for each of the test runs. Speed shall be sensed to an accuracy of ± 2.5 km/h of actual vehicle speed, with the range $V_{\min}$ to $V_{\max}$.

4.2 Transient Response (*see* Fig. 1)

After the set speed is first achieved:

- a) the sensed speed shall not exceed the set speed by more than 5 km/h,

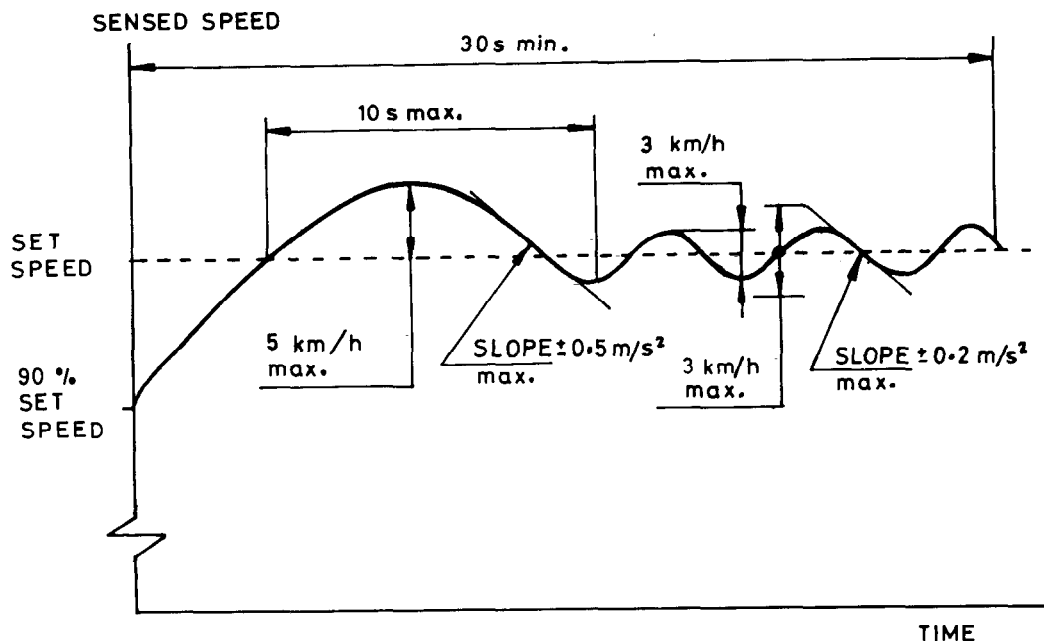


FIG. 1 ALLOWED TOLERANCES OF LIMITER RESPONSE CHARACTERISTIC

- b) the rate of change of sensed speed shall not exceed 0.5 m/s^2 , and
- c) the stabilized speed conditions specified in 4.3 shall be attained within 10 seconds of first reaching the set speed.

4.3 Stabilized Speed (see Fig. 1)

When stable speed control has been achieved:

- a) the sensed speed shall not differ from the set speed by more than 3 km/h,
- b) the sensed speed shall not vary by more than 3 km/h, and
- c) the rate of change of sensed speed shall not exceed 0.2 m/s^2 .

5 SPEED CONTROL ON DESCENDING GRADIENTS

When the vehicle is running at its set speed and with the driver's accelerator at its position of maximum travel, is subjected to an accelerating force due to a down gradient, the speed limiter shall control speed by restricting the engine power to its minimum engine power control setting.

NOTE — The speed limiter shall be designed in such a way that it allows normal accelerator control for the purposes of gear changing.

6 FAILURE MODES

No malfunction of the speed limiter shall result in an increase in engine power above that demanded by the position of the driver's accelerator.

7 CHECKING AND CALIBRATION

The manufacturer of the speed limiter shall provide documentation describing checking and calibration procedures. After installation it should be possible to check the set speed while the vehicle is stationary.

8 INSTALLATION

The speed limiter shall be suitable for installation in the vehicle and shall be installed in accordance with the recommendations of the manufacturer.

9 TAMPER PROOFING

The speed limiter and its connections necessary for its operation, other than those essential for the running of the vehicle, shall be capable of being protected from any unauthorized adjustments or the interruption of its energy supply by attachment of sealing devices, and/or the need to use special tools.

10 POWER SUPPLY

All components necessary for the functioning of the speed limiter shall be energized, whenever the vehicle is being driven.

11 MARKING

The vehicle fitted with the speed limiter shall be marked with the following:

- a) The name or trade-mark of the calibrator;
- b) The number this Indian Standard;
- c) The set speed, expressed in km/h, at which the vehicle is calibrated; and
- d) The month and year of calibration.

ANNEX A

(Clause 4.1)

TEST CONDITIONS AND PROCEDURE FOR DEMONSTRATION COMPLIANCE WITH SPEED CONTROL REQUIREMENTS

A-0 Where the speed limiter is designed to fit a range of vehicles, it is recommended that the tests are performed on a 'worst case' vehicle, so that the need for additional testing is minimized. Examples of worst case situations are as follows:

- a) Maximum engine power to mass ratio of the tested vehicle at $V_{max} + 10$ percent.
- b) Lowest overall gearing which allows the set speed to be attained, that is minimum vehicle speed to engine speed in top gear ratio.
- c) Where the speed limiter actuator is a separate component in the engine power control, the minimum travel of the actuator between maximum and minimum engine power control positions.

A-1 AMBIENT WEATHER CONDITIONS

During testing mean wind speed shall be 3 m/s with gusts not exceeding 5 m/s.

A-2 VEHICLE CONDITION

The vehicle shall be at its unladen weight, plus the mass of the driver and any observer and test equipment. Tyres that have covered only 10 percent or less of their expected life shall be fitted on the vehicle and they shall be inflated to the pressure recommended by the vehicle manufacturer for operation at the vehicle's maximum gross vehicular weight.

A-3 TEST SURFACE CONDITION

The test surface shall be suitable to enable stabilized speed to be maintained, and shall be a dry straight road way free from gravel, uneven patches, etc. The track shall have sufficient length and width for attaining the test speeds. Gradients, if any shall not exceed 2 percent and shall not vary by more than 1 percent excluding camber effects.

A-4 INSTRUMENTATION

During the test, the instantaneous actual vehicle speed and sensed speed shall be continuously recorded.

NOTES

1 It is recommended that the accuracy of measured and recorded speeds should be ± 0.2 percent against a time base accurate to within 0.3 percent.

2 In order to obtain an accurate measure of vehicle speed, a number of steady speed runs in the range V_{min} to V_{max} may be needed (using the speed limiter to provide these steady speeds if convenient). The runs shall be performed over a known distance and the time taken to cover this distance shall be recorded. From the data collected, calculations may then be made of the ratios between recorded speeds and derived speeds, their mean and standard deviations.

A-5 PROCEDURE

Drive the vehicle at a speed equal to 90 percent of the set speed and demand full engine power by moving the accelerator to its position of maximum travel as rapidly as possible. Maintain the accelerator at its position of maximum travel for not less than 30 seconds. Conduct the test three times in each gear, which allows the set speed to be reached.

ANNEX B (Foreword)

COMMITTEE COMPOSITION

Automotive Primemovers Sectional Committee, TED 2

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Members

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SHRI HIRA LAL

SHRI B. GHOSH

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SHRI A. B. PHADNIS (*Alternate*)

SHRI M. N. MURALIKRISHNA

DR C. L. DHAMEJANI

SHRI K. S. JAIN (*Alternate*)

SHRI A. R. GULATI,

Director (Transport Engg)

Representing

University of Jodhpur, Jodhpur

Ashok Leyland Ltd, Madras

Association of State Road Transport Undertakings, New Delhi

Automotive Research Association of India, Pune

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Bharat Earth Movers Ltd, Bangalore

Central Institute of Road Transport, Pune

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Directorate General of Technical Development, New Delhi

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Member Secretary

SHRI M. V. S. D. PRASADA RAO

Joint Director (Transport Engg), BIS

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This Indian Standard has been developed from Doc : No. TED 2 (211).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 323 01 31, 323 83 75, 323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :

Telephone

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{ 323 76 17 323 38 41
Eastern : 1/14 C. I.T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	{ 337 84 99, 337 85 61 337 86 26, 337 91 20
Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022	{ 60 38 43 60 20 25
Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113	{ 235 02 16, 235 04 42 235 15 19, 235 23 15
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